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/ A Theory of Countertrade Financing  
of International Business,

by

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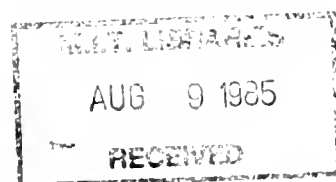
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## I. Introduction

Countertrade is a term which denotes any of a broad class of commercial arrangements for international trade and investment projects the common feature of which is that the financing is denominated partially in the form of commodities instead of money. Countertrade agreements include simple 'barter' deals in which one country supplies a commodity in exchange for another commodity supplied by the trading partner. More complicated countertrade deals include 'counterpurchase' agreements in which one country sells a commodity to a second country and agrees to purchase back at a future date a proportional amount of commodities to be chosen at the later date from a pre-specified 'shopping-list'. Finally, as a part of major industrial development programs requiring the purchase of large amounts of capital equipment many countries impose the most complicated form of countertrade, a 'buy-back' or compensation arrangement. In a 'buy-back' deal, the capital equipment supplier agrees to receive much of its payment not in the form of foreign exchange, but in the form of a portion of future production from the new manufacturing plant.

Countries which have advocated and pioneered the use of countertrade in international business include the Soviet Union and other socialist nations. Countertrade is therefore often associated with East-West trade. The use of countertrade financing in East-West trade expanded tremendously during the 1970's, and the 1980's saw its extension to trade between developed capitalist countries and developing countries. In 1982 Indonesia instituted perhaps the first comprehensive and legally codified countertrade policy outside the

socialist nations. Since then various developing countries have followed suit, while many others have at various times exercised such a policy through administrative discretion on the part of national executive authorities. In addition, several OECD nations have also imposed trade regulations which are analogous to countertrade requirements, especially in regard to trade in agricultural commodities and to sales of aerospace and military equipment. Countertrade agreements of the type mentioned above -- barter, counterpurchase, and buy-back -- currently account for a minimum of 8 percent of world trade.<sup>1</sup>

In this paper we analyze the fundamental economic features of countertrade, and we outline the rational and mutually beneficial economic purposes which it can fulfill as a component of a multilateral world trading system. Barter, strictly defined as the contemporaneous exchange of commodities, is to be distinguished from other forms of countertrade in which the two sides of the transaction are executed at separate times, with the

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<sup>1</sup> See the background study prepared by the General Agreement on Tariffs and Trade, Secretariat for the Consultative Group of Eighteen (CG/18/W.80, 30 March 1984, Geneva), and also John C. Wiecking, Countertrade: Its Nature and Scope, Bureau of Intelligence and Research, US Department of State, Report 821-AR, 1984. The same GATT report states, however, that "...it is impossible to estimate, with any reasonable degree of precision, the actual proportion of world trade consisting of countertrade. ...there are no reliable data available."

Estimates of countertrade's share of world trade from other sources sometimes range as high as 30 and 40% or as low as 1%. Press reports in general create an exaggerated impression of the magnitude. It should also be noticed that most measures refer to the amount of trade for which some level of countertrade is required: the countertrade goods do not always cover the full value of the material originally received, and sometimes they are greater than that value.

For a compendium of the various countries practicing countertrade of one form or another see Pompiliu Verzariu, International Countertrade: A Guide for Managers and Executives, US Department of Commerce, International Trade Administration, Washington DC, October 1984, draft manuscript.

second transaction occurring, for example, 5 or 20 years after the first. These other countertrade transactions -- counterpurchase and buy-back arrangements -- involve complex contracts over long time horizons and represent solutions to difficult problems of uncertainty and trade over time. In this paper we show that counterpurchase policies should, in many cases, be interpreted as devices for the forward selling of commodities where no organized forward or futures market exists, and that by extending the forward markets for these goods these policies improve the intertemporal allocation of both the productive resources and the consumption decisions of the enforcing country. Buy-back agreements, on the other hand, we interpret as efficient agency contracts which bond the original equipment purchasing country against various dangers of which the supplier is either aware or over which it may exercise influence. Buy-back agreements therefore make possible the production and international exchange of goods which would not be possible using more familiar sale contracts. We illustrate these propositions with various examples of countertrade, and show how it is possible in some cases to infer the purpose which a particular policy is intended to fulfill from the special features of that policy and the theory developed here.

This paper therefore complements the existing literature which has focused primarily upon the erroneous economic rationalizations that are sometimes used to justify countertrade, upon the transitory economic ends which it could conceivably serve in countries with peculiar administrative trade regulations, and upon the political purposes which countertrade may fulfill in certain circumstances. By identifying the general rational purposes to which the use of countertrade may be targetted and which suggest

that it will be a persistent if modest feature of the world trading system, this paper can be of use to persons attempting to structure more successfully the countertrade policies of a particular country and to persons attempting to structure superior countertrade financing for a given sale.<sup>2</sup>

## II. Countertrade: Definitions and Distinctions

The single common feature of the diverse commercial arrangements which are referred to collectively by the term countertrade is that a portion of the financing of the payment for sale or for services and licensing is denominated explicitly in terms of or otherwise tied to real commodity deliveries. This contrasts with the usual presumption that the sale price will be denominated and fully paid in traditional monetary terms -- since we are concerned with the case of international trade by 'monetary terms' we mean 'foreign exchange terms.' It is this inclusion of real commodities on both sides of the transactions which is responsible for the common allusion made by many commentators that countertrade is a generalized or complicated form of barter

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<sup>2</sup> Another contribution we make throughout this paper consists in some brief documentation which suggests that these rationales have been articulated by analysts in the socialist countries, the leading practitioners and advocates of countertrade policies. A thorough review of the literature in a socialist country is beyond the scope of this paper, but we provide notes at various points of this paper in which we call attention to the views of experts in the German Democratic Republic presented in a leading government handbook on trade. We believe that a comprehensive review of the socialist literature has been conspicuously missing in western articles attempting to identify the objectives of countertrade financing. The fact that we find the writings of the GDR authors to be expressive of the rational purposes which we have independently identified should, we hope, spark interest in such a comprehensive review, whether or not the results of such a review are in agreement with our tentative observation.

-- a step backward in the development of the international commercial system. The simple allusion to barter has then been employed as an axiom in the subsequent denunciation of countertrade as an irrational trade device.<sup>3</sup> This reference to barter is, however, very misleading with regards to the large majority of countertrade transactions as we will show. Only a small fraction of these deals can be viewed as barter. For most countertrade transactions the essential feature of a barter deal, contemporaneous exchange of goods, is not in fact present.<sup>4</sup>

In this paper we will discuss three forms of countertrade: i) barter, ii) counterpurchase, and iii) compensation or buy-back arrangements. There exist many variants on these three types, and many institutional complications which are referenced in much of the literature as distinct forms of countertrade. Nevertheless, we believe that this categorization captures correctly the distinct economic forces which are at work in most countertrade

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<sup>3</sup> The identification of all forms of countertrade with barter often occurs in western analyses although to varying degrees and with varying levels of understanding of the distinguishing features. Typically it is recognized that other forms of countertrade are more complex, include special credit arrangements and involve trade over time, but these other forms of countertrade are therefore considered 'modernized' forms of barter, or barter with complications. Seldom have these forms been considered to be essentially distinct from barter as we maintain in this paper. The OECD, for example, published a note on Countertrade Practices in East-West Economic Relations. (Paris, November 1979), in which it was asserted that "The fact that in many cases these counterpurchase deals amount to little more than barter or partial barter with a bookkeeping element added, places them firmly within the traditional mechanisms of Eastern trade practices in general. (p. 9)"

<sup>4</sup> We note that the GDR handbook expressly recognizes the distinction between barter and other forms of countertrade which we are here trying to emphasize: see Fritz Enderlein, editor, Handbuch der Aussenhandelsvertraege, Volume 4: Kooperation, Kompensation, Gesellschaft, Konsortium, Staatsverlag der DDR, Berlin 1982, p. 221ff, p. 230, and p. 253ff.

deals. Each type of countertrade may be differentiated from the others in terms of two elements of the transactions: i) the temporal incidence of the exchange of the two sets of real goods, and ii) the types of products exchanged, and their economic or technical relation to one another.

In a barter transaction the two sets of goods are exchanged at the same or nearly the same time. This is the archetypical definition of barter and the basis for the claim that it hampers trade since it depends for success upon 'the double coincidence of wants'. In current world trade the two sides of a barter transaction are typically executed within the space of a single year. Many, but not all, such transactions include primary commodities, typically originating from the country requesting the countertrade of these commodities as a means of financing its imports in lieu of foreign exchange obligations. The demand for barter or payment by means of such primary commodities is often imposed by a country seeking to import manufactured items, even in the case of critically important import items and major plant and equipment.

In a counterpurchase transaction one party imports a commodity and the selling or exporting party undertakes an obligation to purchase from the first party commodities with a value equal to a contracted portion of the original sale value at a future point of time. The critical factor distinguishing counterpurchase arrangements from barter is the temporal separation of the two sides of the transactions. Typical counterpurchase agreements require that the counterpurchase be executed within three to five years after the original sale: the goods which may be purchased to fulfill the counterpurchase obligation are specified in a shopping-list which often includes mostly light

manufactured goods, simple consumer goods, or standardized machinery parts -- these commodities are not usually related to the commodities originally purchased in the first half of the transaction in any technical or immediate economic sense. Finally, the request for counterpurchase as a part of the purchase agreement is typically imposed on non-critical import items, although there exist important exceptions to this.

In a compensation or buy-back agreement one party imports machinery or a complete plant from a second party; the second party agrees to buy back some fraction of the output produced by the equipment, and this repurchase will finance payment for the original sale. These buy-back agreements typically require more than five years before the purchases on the second side begin, and, of course, there is a clear technical association between the original products purchased and those bought back. In some buy-back deals, however, economically related final products may be bought back although they do not originate from the plant and equipment originally sold. Compensation or buy-back agreements are used most often to finance the development of extractive industries, the processing and delivering of primary commodities, and to finance heavy manufacture such as automobile parts and supplies.

In the archetypical model of a current market for goods there is no need for particular sets of goods to be traded against one another exclusively between the two parties desiring each set, i.e. there is no need for barter. In fact, a restriction to barter transactions limits the possibilities for specialization and greatly encumbers the trading system. The more sophisticated yet commonly accepted money-for-sale market involves cash payment on one side of each transaction with the market for real goods

clearing as a final outcome of the full set of cash transactions. Money serves as an intermediary device which facilitates exchange between more than two parties: the seller accepts money because s/he knows that s/he can use it to purchase from other sellers the goods which s/he wishes.

There is a comparable archetypical model for intertemporal exchange and market clearing in which money payments advanced in an early period are used to purchase goods available in future periods, or in which goods are delivered in the current period in exchange for a claim for money in a future period. However, for many types of intertemporal markets this model is not appropriate. Problems of enforceability of contracts, of adverse selection, of moral hazard, and of market completeness often interpose themselves, especially as regards intertemporal exchange and production decisions. We will show in this paper that these issues are critical in the analysis of countertrade transactions, and that the temporal separation of the purchase/counterpurchase or compensation and buy-back transactions distinguishes them from typical barter transactions, and that these countertrade devices may therefore improve the allocation of resources relative to a world market in which these devices are excluded.



### III. Counterpurchase Agreements

#### Forward Markets and the Value to Contingent Sales

As we mentioned above, the critically distinguishing feature of counterpurchase in contrast with barter is the imposition of time: it is this factor which creates the special need for counterpurchase, and so we turn our attention to considering how time imposes on a country's economic decisions. A primary problem for a country selling its commodities on the world market is estimating the future demand for the goods which it sells or which it is considering for sale on the world market. The information about future demand is critical for two reasons: i) it informs the country about the relative profitability of competing choices for the use of its productive resources -- should it produce more steel or should it instead manufacture textiles? -- and ii) it informs the country of the future income it may anticipate receiving from its chosen economic strategy, and this information can be used to improve its own decisions regarding intertemporal consumption choices -- can it 'afford' to purchase this year the marginal or the luxury imports which it is considering? To the extent that a country can improve the precision of its estimates of future world demand for its export products it can consequently improve its own production and consumption decisions.

The best estimates regarding future demand will remain however, estimates, and the exporting country will doubtlessly face some continued uncertainty regarding the eventual sale price of its products. It can likely improve its position better still if it can insure itself against this uncertainty.

Each of these functions -- yielding information on future demand and offering insurance against random fluctuations in demand -- are typically considered to be important services of organized futures markets or exchanges.<sup>5</sup> The futures price impounds information about the anticipated demand since buyers intending to purchase large quantities at a later date will consider either satisfying their demand through a futures contract or waiting to purchase on the spot market. The same may be said about future suppliers. To the extent that buyers (sellers) intending to purchase (sell) at a later date have at the current point in time information about their later intended purchases (sales), then that information will be impounded into the equilibrium futures price. This futures price is then an informative signal regarding the anticipated demand (supply) for the product in question. Moreover, a country which anticipates selling its commodities on the spot market at a later date can instead sell its expected production, or a fraction thereof, on the futures market. By selling the correct contracts on the futures market the country may lock in a given sale price for its commodities. In this manner the country is able to insure itself against the random fluctuations in the spot price.<sup>6</sup>

Organized futures exchanges fulfill these roles incompletely. The primary constraint on the relevance of these exchanges with which we will

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<sup>5</sup> By organized futures exchanges we mean primarily the Chicago Board of Trade, the Chicago Mercantile Exchange, the Commodity Exchange New York, the Chicago Rice & Cotton Exchange, The London Metal Exchange, et al.

<sup>6</sup> The insurance, or risk-shifting, value of counterpurchase agreements has been discussed by Bruce Kogut. "Selection of Contracts in East-West Trade," Working Paper, Institute of International Business, Stockholm School of Economics, 1983, p. 18.

concern ourselves in this paper is the restricted domain in which they function. Only a small number and a few types of commodities may be traded on organized futures exchanges -- generally, standardized raw materials and agricultural commodities such as corn, crude oil, lumber and copper -- and for even these commodities the market extends forward for a very brief horizon -- typically less than a year. Commodity exporters of goods not traded on these exchanges, and traders concerned with longer horizons must seek alternative means with which to solve the twin problems of estimating future demand and insuring against fluctuations in the future demand. Although it may not have available the alternative of selling its commodities on an organized exchange a commodity producer may nonetheless sell its commodities forward through individually negotiated long-term supply or delivery contracts. Coal is one commodity for which such long-term contracts are typical and in which the market is well organized although it does not take the form of an exchange. Natural gas is another commodity for which long-term contracts are typical. For both coal and natural gas, and certainly for other commodities in which long-term contracts are typical there are special reasons, supplementing those mentioned here, for which one would seek to contract a forward sale; but the informational and insurance functions cannot be ignored.<sup>7</sup> By selling in this

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<sup>7</sup> In this paper we will speak primarily of 'forward' sales in which the seller commits to deliver a quantity at a future point in time, and the buyer agrees to pay a set price at the same future point in time. A 'futures' contract is slightly different in terms of the transactions which occur between the time of agreement and the maturity date of the contract -- the daily 'settling up'. The details of the distinction are not relevant for the general points to be made in this paper. For a careful statement of the difference see Fischer Black, "The Pricing of Commodity Contracts," Journal of Financial Economics, 3 (1976), pp. 167-179, and John Cox, Jonathon Ingersoll, and Stephen Ross, "The Relation Between Forward Prices and Futures Prices," Journal of Financial Economics, 9 (1981), pp. 321-346.

'private' market, the commodity exporter obtains an estimate of the later demand as well as an assured price.

The counterpurchase commitments required by many countries and to which many companies agree obviously replicate these important features of a forward contract. The holder of the contract has agreed to purchase a quantity of the agreed upon commodities at a future date, i.e. the holder is long in a forward contract. The success with which a country succeeds in negotiating counterpurchase commitments yields to that country a critical signal on the future demand for its commodities.<sup>8</sup> The tighter the future demand, the more difficult it will be to negotiate successfully counterpurchase commitments at any given price. The commitments themselves serve as insurance contracts against fluctuations in future demand and price in the same fashion that futures contracts bought and sold on the organized exchanges serve as insurance contracts. A country might therefore rationally impose a counterpurchase policy as an attempt to organize the forward sale of its exports.

This need to organize the forward sale will be felt to different degrees in different countries, and hence the pressure to impose a counterpurchase policy will assert itself in some countries more than in others. One might

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<sup>8</sup> The general property that an equilibrium market can yield information to the participants in the market is well established in the economics literature. However, we are speaking here of an 'unorganized' market. Although the possibility of signalling in the market is unchanged by the change in the rules of the market -- private negotiation and search among parties vs. a clearing auction -- nevertheless, the actual properties of this 'unorganized' market are unclear, and little study has been given to analyzing them. Our discussion below, especially of the pricing pattern in counterpurchase contracts is one suggestion for the direction of research.

expect that a country which is facing an extremely tight foreign exchange budget, due either to the low absolute level of its export earnings, or, for example, due to a currently high commitment of its export earnings to service its debt, would find the necessity of budgeting its import consumption expenditures over time to be a particularly pressing concern. Such a country must scrutinize more carefully than must others its potentially excessive current expenditures since the event of poor future exchange earnings will impact it more severely. The value to this country of the information provided by a forward market is especially high. This is then the very country for which a counterpurchase policy would be especially valuable. This may explain why many observers have found that counterpurchase policies are implemented by countries facing a tight budget constraint on their foreign exchange, and why some analysts have advocated the use of counterpurchase policies by these same countries.<sup>9</sup> The presumption that countertrade actually conserves on foreign exchange is, of course, fallacious as has often been pointed out. Counterpurchase requirements may, however, aid a country in the prudent allocation of its scarce foreign exchange, and this effect may have been poorly articulated although it has nevertheless been felt and has operated as the impetus behind the actions of many countries.

Our explanation for counterpurchase helps to explain as well the differential application of the counterpurchase requirement imposed by many

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<sup>9</sup> Observers of the popularity include Pompiliu Verzariu, Countertrade Practices in East Europe, the Soviet Union, and China: and Introductory Guide to Business, US Department of Commerce, April 1980, p. 2, and Gary Banks, "The Economics and Politics of Countertrade," The World Economy, 6(1983), pp. 164-5; neither is an advocate of this position.

countries across various types of import items. A counterpurchase policy consists of two components, only one of which is the forward sale of various commodities. The second component is the refusal on the part of the country imposing the requirement to import commodities from a given seller unless that seller accepts a counterpurchase commitment. The current import of commodities is thereby made directly contingent upon the successful forward sale of the export items which the country has to offer. Many writers have claimed that this 'tie' is disadvantageous to the country imposing it since it makes mutually beneficial import purchases disadvantageous to the company selling the import and required to take the counterpurchase goods in payment, and therefore threatens the deal. But as we have noted in our explanation, one primary purpose for the forward sale is precisely the creation of a dependency of import purchases upon the results of the forward sale. The 'tie' feature of a counterpurchase policy is a convenient device through which to implement the conditional dependence of the current import level on future export revenues. According to our explanation, therefore, one would expect that countries will restrict the imports of luxury or marginal commodities in the event of poor forward sales of its own exports: in the framework of a counterpurchase policy this would mean tying such imports to the successful conclusion of counterpurchase commitments. Exactly this correspondence has been observed by practitioners of and experts on the trade.<sup>10</sup>

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<sup>10</sup> Pompiliu Verzariu, a US Commerce Department expert on countertrade has found that, "Several categories of imports, which have different CT requirements can be differentiated. These are:  
- High priority imports of the five-year plan (FYP), mainly plant and industrial equipment destined to fulfill major domestic needs or to generate hard currency exports. These have allocated hard currency funds and for them CT is not usually required. ...  
- Imports of plant and industrial equipment for projects included in the FYP, but whose implementation is strictly predicated on 100 percent self-liquidating arrangements (e.g., East European plants for the manufacture of

## Pricing in a Counterpurchase Agreement

Our discussion so far has focused upon the content of these policies as devices for the forward sale of commodities without carefully discussing the exact form of the counterpurchase commitments. Counterpurchase commitments do not take the form of simple forward market sales, and popular discussion of particular counterpurchase agreements has focused attention on several curious features of counterpurchase commitments which have then been interpreted to imply that these policies do not serve rational commercial purposes.

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synthetic fibers). Because no hard currency has been allocated for these projects, they will require a CT commitment of at least 100 percent of the Western export contract value;

- Planned imports of intermediates, specially drugs and chemicals, semifinished goods, machinery destined for the domestic market or for export to non-Western countries, such as CMEA or LDCs, for which the allocated hard currency may be insufficient. Partial payment in CT goods may be required for these imports. The levels of CT requested is predicated on the hard currency budgeted for the import and on the volume of unsold domestic goods allocated to the FTO for export that year;
- Import of consumer and luxury goods or any other product, equipment, machinery or technology for which no hard currency has been planned (either because the goods are considered non-essential to the Communist country's economy or because they have come to the attention of prospective end-users too late to be included in the annual purchasing plans) usually require a 100 percent CT arrangement" (in Verzariu, Countertrade Practices, 1980, p. 30; see also L. Welt, Countertrade - Business Practices for Today's World, AMA Management Briefing, 1982; L. Welt, Trade Without Money: Barter and Countertrade, New York: Law and Business, 1984, p. 32).

Similar evidence is offered by the delicate sensitivity expressed by the Coca-Cola corporation to its own position in this priority ranking of import items and its success in countertrade: According to the Wall Street Journal, "...Coca-Cola is prospering from countertrade... It has two advantages: It was involved in countertrade before the term was coined, and it has an extensive world-wide marketing apparatus. 'We aren't an essential industry,' says Coke's chairman, Roberto C. Goizueta. 'We have to behave like a guest.' ...In 1977, Coke beat out Pepsi and won the use of a new Polish bottling facility by agreeing to export one million cases of Polish beer within five years" (3-13-85, p. 31).

In order to understand the special structure of counterpurchase commitments it is useful to first call attention to the various forms which a forward contract may take, even in a 'free' domestic market. The most obvious form is a 'simple forward contract' which is essentially a mimicry of the structure of the classical spot sale. The supplier agrees to deliver a fixed quantity of the specified commodity at a given location and date for a given price to be paid at the future date. An alternative type of forward sale is typical in the electrical power industry and is sometimes referred to as a priority pricing sale. This type of sale is often used where total supply or demand at any time fluctuates suddenly and quickly. This occurs in the electrical power industry due to the various factors affecting the generating and delivery equipment, and due to the surges in demand on the part of various customers or in the arrival of new customers. In a priority pricing sale the supplier posts a schedule of prices. The highest prices represent the highest priority customers. Customers choose the price at which they will purchase electricity, or equivalently choose the priority with which they will be delivered electricity. The supplier then at each point in time delivers to the highest priority customers the supply which they demand: it then delivers to the next level of customers their demands, and so on until the capacity is fully exhausted. Each customer pays the price which it originally chose. Hence at any point in time some customers will be paying lower prices than other customers although they are each receiving the same commodity; the customer paying the lower price may however be cutoff or rationed in periods of high demand or low capacity. In the event that the demand of the full set of contracted buyers is fulfilled and capacity is not exhausted, the



electricity producer may sell the 'excess' output on the spot market.<sup>11</sup>

We may view the export side of a counterpurchase policy as a form of priority pricing of the goods on the counterpurchase list. A commodity which the country imposing the policy seeks to forward sell is placed on a counterpurchase list, and an ask price is posted. Buyers seeking to forward purchase the commodity at the ask price will enter into counterpurchase commitments in which they bind themselves to purchase at or before a later date a given quantity of the commodity at the ask price. Potential buyers not willing to pay the ask price will decline any counterpurchase commitments. At the future date the total number of counterpurchase commitments for the commodity may or may not exhaust the capacity or supply of the commodity available. If it exhausts the capacity then no supply will be available at any other price; in fact it may be that not all counterpurchase commitments will have been fulfilled in total. On the other hand, if total capacity is not exhausted, then remaining supplies will be sold on the spot market at a clearing price which is necessarily less than the originally posted ask price. Nevertheless, the few companies which did negotiate counterpurchase commitments must pay the contracted posted price. The posted ask price at which all counterpurchase commitments are fulfilled is therefore above the average price at which the commodity is exchanged. Some companies will rationally enter into the counterpurchase commitment at the ask price, since

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<sup>11</sup> These two types of sales absent the forward character are carefully detailed and analyzed in Milton Harris and Artur Raviv, "A Theory of Monopoly Pricing Schemes with Demand Uncertainty," American Economic Review, 71 (1981), pp. 347-365. For an adaptation of their analysis to forward markets see John E. Parsons, "Notes on the Forward Sale of Commodities through Counterpurchase Agreements," mimeo, MIT, March 1985.

they anticipate the possibility that the full supply may in some cases be exhausted at that price and unavailable on the spot market, just as some purchasers of electricity contract to buy 'non-interruptable' service at prices which are above the average price at which electricity is delivered. Viewed in this fashion a counterpurchase policy is a priority pricing forward sale in which the posted or contracted price represents the high priority price.

It should be noted that the counterpurchase commitment, a commitment to buy the commodity, is not equivalent to a long position in a simple forward contract since the selling country does not offer a guarantee to supply the good to all holders of the counterpurchase commitment. If the full supply of the goods for which a buyer has a counterpurchase commitment are sold out because many companies have entered into counterpurchase commitments, then remaining holders of the commitments merely find their commitments cancelled.<sup>12</sup>

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<sup>12</sup> Note that this does not mean that the supplier can cancel the commitment to sell at the ask price because the spot price has risen above the ask price. We are speaking here of a situation in which the supplier meets the commitment to supply the agreed upon units of the commodity, but the number of buyers willing to enter the sale at the posted price is greater than the total supply capacity; then not all buyers will receive the quantity they would like at the contracted price, but the seller does not withdraw the ask price and sell the goods at the higher clearing price. It is precisely the possibility that the good will be sold out even at the relatively high posted or ask price, that induces buyers who estimate highly the future value of the good to themselves to attempt to purchase the good at the relatively high forward price. If the seller were expected to offer no goods for sale whenever the demand for counterpurchase commitments is high, then no high valuation buyer would be willing to negotiate a countertrade commitment in the first place. The only internally consistent set of expectations and behavior is the one described. This contention is strengthened for the case of a seller seeking to maintain a counterpurchase policy over many years due to the need for a good reputation. For a careful presentation of these arguments see Harris and Raviv, "Monopoly Pricing Schemes," 1981; and for this case of counterpurchase commitments see Parsons, "Notes Counterpurchase Agreements," 1985.

Of course, potential customers which had not entered into any commitments face a greater likelihood of being rationed or excluded from the supplies.

Our interpretation of counterpurchase policies as priority pricing forward sales helps us to understand some observations that have been made concerning what appear to be curious features of the counterpurchase. One frustration which western businessmen and government officials have expressed as a result of their experience with counterpurchase is that the western corporation is being forced to accept commodities at prices far above those at which these commodities would trade in the world market. Either the price is simply 'too' high or the quality of the commodity is significantly below that which is considered the standard in the international market, it is asserted. To support this complaint about artificially high prices examples are sometimes given of a commodity purchased by a western firm in a counterpurchase deal at the posted price, while the same commodity is simultaneously purchased by another western corporation without a counterpurchase commitment and at a lower price.<sup>13</sup>

Such examples are neither a curiosity nor evidence of poor pricing if the commodity is being sold in a priority pricing system. Just as with electrical power, sometimes the supply capacity will not be exhausted at the highest price, and then the remaining output will be sold at a discounted or clearing price while the customers who chose the high or top priority price will pay that higher price. On the other hand, at other times these high priority

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<sup>13</sup> This view is expressed in the US Department of Commerce guides to countertrade practices. For example, "Prices of CT manufactured goods are established semiannually or annually and are usually offered at inflated rates..." in Verzariu, Countertrade Practices, 1980, p. 27, fn. 8.

customers will be the only ones able to obtain supplies of that commodity, and they will be pleased that they are receiving it at the posted or priority price. On these occasions, however, no second price is posted and the inability of other buyers to obtain supplies of the commodity is not as strikingly apparent as is their ability to obtain the commodity at the discount price: the winner brags less on these occasions than it complains on the former occasions and a biased impression is maintained of the results of the sale.<sup>14</sup> On average the buyers are neither better nor worse off in the priority pricing forward sale than in the more familiar simple forward sale.<sup>15</sup>

#### Evaluating Complex Counterpurchase Policies

Several additional comments need to be made to complete our discussion of counterpurchase policies. First, we have represented counterpurchase

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<sup>14</sup> This tendency to selective reporting was noted in a recent report on countertrade by the Wall Street Journal: "Most countertrading is shrouded in secrecy. According to Christopher Adamski, the director of world trade for PepsiCo International, 'the good countertrade deal is the one you don't hear about'" (3-13-85, p. 1).

<sup>15</sup> This indifference on the part of buyers, and on the part of the seller, between the various types of forward sales which are available is one example of an important proposition in the literature on methods of sale and auctions: discriminatory and single price auctions, appropriately structured, yield the same expected revenue. The result only holds, however, for one basic case. In other variations on the environment the seller and the buyers will not be indifferent between the types of sales. There are cases for which each type of sale, the discriminatory and the single price sale and correspondingly the counterpurchase forward sale and the simple forward sale, will be preferred by the buyer or conversely the seller. For the general propositions see Harris and Raviv, "Monopoly Pricing Schemes," 1981; Parsons, "Notes on Counterpurchase," 1985; Paul Milgrom and Robert Weber, "A Theory of Auctions and Competitive Bidding," Econometrica, 50 (1982), pp. 1089-1122; and Robert Weber, "Multiple-Object Auctions," CMSEMS DP. 496, Northwestern University, 1981.

commitments as commitments to purchase a single good. In point of fact the agreements usually specify a commitment to purchase a fixed value of goods from a shopping list of various commodities.<sup>16</sup> The exporting country controls the contents of the shopping list. The list changes from year to year, and the commitment originally made to purchase goods at a later date is a commitment to purchase from the list as it stands at that later date, and at prices which are not in fact posted until that later date. Facing an individual buyer with a completed agreement, and maximizing exclusively its immediate revenue, the supplier would obviously put on the list worthless commodities at inflated prices. However, when a country establishes a countertrade policy it maintains it for many years, and its choice of products and prices certainly influences the willingness of future customers to enter into a commitment with it. A country therefore has an incentive to maintain a consistent policy regarding its counterpurchase shopping lists. According to

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<sup>16</sup> The fact that the counterpurchase commitment is not for a single specified good, but rather represents a claim on a bundle of goods makes the problem of rationing mentioned in footnote 12 above very complicated. When one particularly popular element of a counterpurchase list is sold out, a company seeking to fulfill its counterpurchase commitment with an order for this commodity will not have its commitment cancelled. Instead, it must choose from the remaining commodities. At the same time, the original contract can be written specifically enough so that a company is excused from its commitments if all the goods satisfying the original stated shopping list are sold out. This means that the companies holding counterpurchase commitments are involved in a game among themselves to choose the best goods to use for their counterpurchase commitment before these goods are sold out, weighing at the same time the consideration that if the full set of goods is of low quality they might prefer not to fulfill the commitment in the hopes that it would be cancelled. This aspect of the gaming was referred to in comments by traders to reporters for the Wall Street Journal: "A countertrader at Massey-Ferguson Ltd. says his company doesn't talk about its countertrade either. 'Finding and selling a product from the Third World is the hardest part,' he says, 'and if someone else finds out about it, they can go after the same products'" (3-13-85, p. 1).

our description of the counterpurchase policy as a priority pricing sale, a country may sensibly include commodities in this shopping list at posted prices which will sometimes be above the clearing price, although these prices must be low enough so that sometimes the available supply will be sold out. Similarly, a country may remove a commodity from the shopping list as long as it adds other commodities and maintains a list with stable features.<sup>17</sup>

A second reason why a counterpurchase commitment is not a replica of a long position in a simple forward contract is that most counterpurchase commitments include a provision for the buyer to opt out of the contract for

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<sup>17</sup> One would expect, that given our description of the motivation for the exercise of a counterpurchase policy that there must be some general properties consistent with this purpose or implied by it which an optimal shopping list would exhibit and which buyers entering a commitment to counterpurchase would expect to be characteristic of the future list. In particular, since the advantage of a forward sale of commodities hinges upon the informational content of the willingness of buyers to enter into a commitment, this informational content may be stronger for some commodities than for others, and one would expect that these commodities would be prominent on counterpurchase shopping lists. Alternatively, if the country intends to use the information to adjust its allocation of productive resources, then the commodities for which it has the ability to execute this shift in response to success in the forward market would be similarly represented in such a shopping list.

Finally, a priority pricing forward sale yields a better or worse sale price than a simple forward sale depending upon the nature of the market to which the country is selling its goods. The advantages of a counterpurchase policy in this regard hinges critically upon the extent to which the potential buyers possess private marketing information or expertise for the export items offered by the country. Commodities for which this is the case might reasonably be expected to appear on such shopping lists. In fact, many observers have noted that certain commodities appear on these shopping lists, only to be removed once a consistent market has been identified. This observation would be consistent with our explanation of the purpose and nature of counterpurchase policies, and may explain the pervasive presence on the lists of light manufactured standard commodities and consumer items for which marketing problems represent a prime feature of the value. It may also explain why counterpurchase commitments are employed for markets in which the seller has no experience with the particular product. See also the discussion in footnote 19 below.

some penalty fee. This means that the buyer with the long position also holds an option.

We have argued above that a counterpurchase policy is used to create both a forward market for a country's commodities, and to create a contingency between its current expenditures and the equilibrium results of the forward sale. Conditioning each separate trade on the forward sale of some good is certainly not the only device through which one might achieve the desired contingency of current imports upon forward sales. This trade by trade dependency is, however, what leads many to associate counterpurchase policies to barter, and it is the very feature which leads them to object to it as extremely inefficient. The trade by trade dependence appears to constrain the set of possible trades since it forces the familiar need of a double coincidence of wants -- a coincidence on the part of the buyer and seller although not at the same point in time. If a country is attempting to forward sell its commodities at high prices, one is hard pressed to explain why they should restrict the set of buyers of any particular commodity to those companies involved in selling commodities to them. Were actual practice as rigid and constrained as described, then this objection might be of significant weight: actual practice is much more sophisticated.

To begin with, current practice on the part of the countries imposing counterpurchase would not leave one to view it as anything but a modest, if nevertheless important, element in the multilateral world trading system. Nor have the conscious advocates among these practitioners -- private consultants excepted -- ever presented it as anything but that. The lion's share of merchandise trade involves no counterpurchase commitment, and as we have

pointed out, the commodity imports for which counterpurchase commitments are required are carefully selected to represent those imports which are in fact marginal in the view of the importing country.

Secondly, many western corporations represent rather large and diversified trading partners relative to the countries imposing these conditions, and it is not at all unlikely that the same company might be a seller of one commodity and a future buyer of other commodities: by some estimates 45% of goods purchased in counterpurchase commitments have been used by the company in its own operation as opposed to being resold to a trading company.<sup>18</sup>

Third, it is not easy, as experience has shown, to create a broad acceptance of forms of trade which do not obviously mimic the familiar: and yet, to the countries advocating these devices, they are of significant value. The project by project contingency of sales is certainly one powerful device with which the importance of these devices can be impressed upon commercial partners, even if at a temporary cost to those exercising the policies -- marketing experts are not unfamiliar with the common need to take up-front losses in an effort to establish a new product. The success of this 'marketing' effort can be seen in the fact that counterpurchase agreements are no longer two-party affairs. Many major corporations have developed

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<sup>18</sup> Estimate made by "The Countertrade Project" in a presentation given at a Countertrade Conference in New York City, December 15, 1983 by Willis A. Bussard, Director; the figure is taken from results of the "Survey of Problems in US Countertrade" conducted by the CT Project under the sponsorship of the National Foreign Trade Council Foundation.

This may be a primary reason why companies like General Electric, General Motors and Coca-Cola, each with its own wide network of markets and products, are among the most successful participants in countertrade operations.



associations with trading companies or have formed trading companies of their own, so that negotiations on any given counterpurchase agreement seldom require an exclusively double coincidence of wants. In fact, some companies have developed an expertise in assessing the future value of another country's counterpurchase goods, so that it appears that there has been some success on the part of these countries in developing an active forward market if not an exchange.<sup>19</sup>

The possibilities which exist for mitigating the problems of the double-coincidence of wants while at the same time preserving the advantages of the forward sale and import contingency created by counterpurchase policies are best illustrated in the current efforts on the part of the Bank of Boston and the General ~~Motor~~<sup>Foods</sup> Trading Company to create an~~d~~ International Trading

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<sup>19</sup> A prime example of this development is provided by the experience of the Coca-Cola company: "In the late 1970's, Coke decided that instead of struggling to get rid of whatever was foisted on it, it would develop new products itself by turning them into brands. To make the switch from the usual one-shot deal, Coke had to improve product quality, design new packaging and research Western markets. But Coke's aggressive approach permitted the company to take advantage of its expertise in quality control and marketing" (Wall Street Journal, 3-13-85, p. 31).

Many authors have in fact viewed counterpurchase policies as one device through which the enforcing country may be 'purchasing' marketing experience. This argument deserves exploration, although on face value it contains little merit. There exist many alternative, superior, contractual forms through which the country could 'purchase' marketing expertise. There may, however, be some point to viewing the purchase of marketing information in a fashion similar to the manner in which we claim the country may be purchasing general information about future demand. Each major multinational trader or corporation may possess specialized information; information as a commodity has strong externality properties, and it may be that counterpurchase policies are some device with which the country may exaggerate these externalities and thereby lower the price of the marketing information. This line of reasoning is highly speculative, but for a tangentially related view of various information selling strategies see Anat Admati and Paul Pfleiderer, "A Monopolistic Market for Information," mimeo, Graduate School of Business, Stanford University, 1985.

Certificate -- a liquid market in counterpurchase obligations.<sup>20</sup> Experience with countertrade may encourage additional innovations which will make the current form of counterpurchase policies obsolete; but then only to the extent that the trading system is progressively developed to satisfy the important needs for which these policies are currently designed and which have been brought to our attention through the imposition of these policies.

Finally, and perhaps most importantly, the priority pricing scheme has a special character to it, one mentioned above. The supplier has not committed itself to specific delivery on each contract, but rather to the complete sale of the specified capacity. This uncertainty about supply availability may be difficult to give legal recognition in other forms of forward sale, and yet may be critical for the particular commodities for which countertrade commitments are required. The commitment to supply the full 'capacity' may be enforceable as an obligation in an implicit contract enforced by repeated performance -- the reputation of the country imposing the counterpurchase policy which we have stressed; and yet, the commitment may not be verifiable in a legal sense, enforceable on any given sale contract.<sup>21</sup> These types of commitments may only be enforceable as components of other sales transactions, i.e. as tied counterpurchase policies.

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<sup>20</sup> See Business Eastern Europe, July 6, 1984 for an early announcement of these efforts.

<sup>21</sup> The distinction to which we are referring here is known in the economics literature on efficient contracts as the difference between observable and verifiable information. Observable information cannot be contracted against while verifiable information can be. See Bengt Holmstrom, "Moral Hazard and Observability," Bell Journal of Economics, 10, (1979), pp. 74-91, fns. 17 & 19, and "Moral Hazard in Teams," Bell Journal of Economics, 13, (1982), pp. 324-340, fn. 5.

Previous discussions of the imposition of counterpurchase policies have focussed upon the claim that a counterpurchase policy could expand a country's export capability either by forcing importers who would otherwise not purchase export items to do so, or by eliminating the use of scarce foreign exchange. As mentioned above, neither rationale makes sense except under peculiar circumstances. Importers forced to export items which they otherwise would not will either demand higher prices for their imports to compensate for the losses or will arrange for an otherwise intending exporter to purchase the export via the importer instead of directly from the supplying country. The elimination of foreign exchange from the import transaction is of course counterbalanced by the elimination of foreign exchange received for the export now delivered to service the counterpurchase transaction.<sup>22</sup> There is one commonly discussed case in which the claim that a counterpurchase policy may expand a country's export earnings has been given a theoretically consistent rationale: that is the case in which the supplying country is a monopsonist in the commodity market in which it is purchasing.<sup>23</sup> One must consider each case

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<sup>22</sup> Among many sources for the exposition of these arguments against the fallacious contentions on behalf of counterpurchase policies is Banks, "The Economics and Politics of Countertrade," 1983.

An analysis of a case in which the argument can make sense for a short time due to various additional constraints on the market -- i.e. a second best analysis -- has been made by Elizabeth Goldstein, "A Theoretical Model of Countertrade," Research Paper 8404, Federal Reserve Bank of New York, June 1984.

<sup>23</sup> The theory behind the extension of monopoly (or monopsonistic power) through tying arrangements analogous to counterpurchase policies was stated in James Ferguson, "Tying Arrangements and Reciprocity: an Economic Analysis," Law and Contemporary Analysis, 30(1965), and for international trade problems by R.E. Caves, "The Economics of Reciprocity: Theory and Evidence on Bilateral Trading Arrangements," in W. Sellakaerts, ed. International Trade and Finance: Essays in Honour of Jan Tinbergen, London, 1976.

to determine if monopoly power may be the underlying force; there is, however, almost no plausability to the contention that the country's actually practising counterpurchase policies are, in general, monopsonists with regards to the goods which are subject to these policies.<sup>24</sup>

In contrast to these earlier discussions of counterpurchase policies, our theory for the imposition of counterpurchase policies illustrates that these policies may in certain cases be rational devices for improving the efficiency of the world trade system. Counterpurchase policies improve the budgeting decisions of the countries imposing them; negotiations for counterpurchase commitments represent an attempt on the part of supplier countries to extend the use of forward markets in the world marketplace on commercially favorable terms.

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<sup>24</sup> Secretary of State George Shultz claimed that the monopsonistic power of Eastern buyers was in fact the source of the preferential credits sometimes given them by Western suppliers, and the reason why countertrade practices such as buy-back arrangements persist; he did not specifically mention counterpurchase transactions; see his speech to the OECD ministerial meeting published in the State Department Bulletin, July 1983, p. 43. Gary Banks makes a short comment that monopsonistic power cannot, when correctly formulated, justify the use of counterpurchase due to the empirical lack of that power; see "The Economics and Politics of Countertrade," 1983.

#### IV. Buy-Back Agreements

Using barter, i.e. a simple spot market, as the touchstone, we have called attention to the importance which the uncertain future economic performance of a country must play in its current economic transactions, and we therefore have pointed out the need for or value of a forward market. A counterpurchase policy is one device which serves this need: by making the current purchases contingent on forward sales it supports a more rational allocation of productive and consumption expenditures in the enforcing country. As we mentioned, the factor which distinguished counterpurchase from barter was the temporal separation of the two sides of the deal. Buy-back deals are also distinguished from barter by the temporal separation of the two sides of the deal, and this separation is typically much longer. Uncertainty regarding the future is certainly one critical aspect of the need for buy-back deals. However, buy-back deals differ from both barter and counterpurchase agreements in that the purchase of the original plant and equipment is financed not by the resale of unrelated products, but by resale of the products which directly result from the operation of the plant and equipment. If we are to understand buy-back agreements, then we must appreciate the reason for which this particular tie is imposed, and therefore the aspects of uncertainty regarding the future which differ from those justifying counterpurchase policies.<sup>25</sup>

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<sup>25</sup> There exist exceptions to this rule that the commodities counterdelivered in buy-back contracts are the output from the plant originally delivered. In some cases these alternative goods are either identical commodities merely produced in a different plant or they are commodities which are technically related to those to be produced from the plant being bought, but also produced in a different plant. This case is discussed in footnote 30 below. In yet other cases some fraction of the goods counterdelivered are not in any fashion related to the original plant and equipment. This case is discussed in

Several special problems arise in markets for plant and equipment, each of which has received careful attention in the economics literature of recent years. One problem, well known under the label "the lemons problem", arises when the seller of the plant has superior information regarding the quality and/or the future value of the commodity to be produced from the plant: this problem is also referred to as adverse selection.<sup>26</sup> This will be relevant whenever the seller has privileged marketing information of various sorts: if the seller is a technological leader in the industry and has private information about competing product lines which it, or others to be licensed by it, will shortly be introducing; or if the plant seller has significant information about total competing plant capacity in certain territories or of the level of product demand in those territories; or if the plant produces intermediate inputs in an entire process, and the plant seller operates on both ends of the production process and therefore has special knowledge about the future level of demand for the product.<sup>27</sup>

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footnote 36 below.

<sup>26</sup> George Akerlof, "The Market for 'Lemons': Qualitative Uncertainty and the Market Mechanism," Quarterly Journal of Economics, 74, (1970), pp. 448-500.

<sup>27</sup> We focus here purposefully upon specialized knowledge which the seller has regarding the demand side, of the value of the plant and equipment, the price at which the plant's output will eventually sell. One might suspect that more typically the supplier of the plant and equipment would have specialized knowledge of the operating cost structure associated with the plant, i.e. the supplier would know how well the machinery worked. This will be true for many industrial projects, and it will create 'problems' similar to those outlined in this paper and requiring appropriate contracting solutions. However, there will be other cases, the cases at issue here, for which the demand side is the critical one, i.e. the feature for which the private information is dominant.

When the cost side is most important, then the discussion here will not be relevant; we can show that when private information about cost is most relevant, then buy-back arrangements will not be a useful contracting form, and instead joint ventures or simple equity positions will be necessary.

This is another illustration of how our analysis helps to define both the proper role and the useful limits of countertrade devices within the entire

In this case, purchase of the plant and equipment by means of a simple sale contract -- i.e. the purchaser pays a price, takes delivery with appropriate operation tests, guaranties and warranties, and this fulfills all contractual conditions -- will not lead to the most efficient market in the plant and equipment. In the case of the lemons problem, or adverse selection, the buyer can be certain that in a simple sale contract it will be receiving the 'lemon' plants. Manufacturers of plant and equipment will gladly sell outdated designs and shortly to be antiquated plants or product licenses. If the plant sale contract does not contain assurances of the sale price of the output from the plant, then the sellers of the 'lemon' plants will always offer an attractive price on the plant. The buyer will, of course, anticipate that it will likely be contracting for the 'lemon' plant, and therefore will discount the value of purchasing plant and equipment; many possible sales will be refused unless more sophisticated contracts are written.

The buy-back contract is one such sophisticated contract. A buy-back contract serves in this case to allign the interests of the seller of the plant and equipment and the plant buyer/operator with each other as regards the ultimate value of the plant's output.<sup>28</sup> The seller of the plant must

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spectrum of financial and economic contract types necessary for the optimal level of economic cooperation. For demonstration of these propositions see John Parsons, "Notes on the Optimality of Characteristic Buy-Back Contracts," mimeo, MIT, 1985.

<sup>28</sup> This purpose has been identified in the GDR trade handbook: "Das Ziel der Gegengeschaeft besteht wie bei den bisher behandelten Kompensationsgeschaefte letztlich darin, dem Kaeufer einer Ware die Gegenseiteigkeit der Handelsbeziehungen zu garantieren, indem ihm auch die Abnahme von Waren zugesagt wird. Diese Gegengeschaeftszusage stimuliert den Kaeufer zum beabsichtigten Import und soll ihm die Sicherheit geben sowie dem Verkaeuffer die Verpflichtung auferlegen, dass anschliessend Handelsgeschaefte in der entgegengesetzten Richtung getaetigt werden, der Verkaeuffer also dann als Kaeufer auftritt" (Enderlein, Handbuch, 1982, p. 265).

agree at the point of sale to repurchase the output at some price. Hence, the seller of the plant maintains a concern about the future sale price of the output: it will earn as payment for the plant the price at which it can resell the contracted output bought back, and hence will take as a loss any shortfall of the future sale price relative to the agreed upon contracted price. In the lemon example discussed above, the seller of plants which will be shortly outdated, lemon plants, will refuse to buy-back significant levels of output since they anticipate that the output will sell at too large a discount in competition with the anticipated improved products.<sup>29</sup>

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<sup>29</sup> An interesting alternative explanation for various buy-back contracts also in the face of problems of product quality and adverse selection has been given by Peter Murrell in "Product Quality, Market Signaling and the Development of East-West Trade," Economic Inquiry, 20, (1982), pp. 589-603. The problem of product quality identified by Murrell is strikingly different from if not the converse of the problem identified in this paper. Murrell supposes i) that Eastern European countries have a general reputation for poor quality goods, ii) that western customers cannot easily determine the quality of the products manufactured at a particular enterprise, and finally iii) that western suppliers of the capital goods used by a particular enterprise can determine the quality of the products manufactured, at least at lower expense than can the western customer. Therefore, the Eastern European manufacturer of superior products will signal its superior quality products to its buyers by selling its output through its western equipment supplier who acts as a certifier of its quality -- the device for this marketing agreement is a buy-back contract.

In our analysis, on the other hand, the problem is to identify the quality of the product to be delivered by the plant and equipment seller, the western seller in many cases. Each of these alternative explanations, Murrell's and our own, may be correct in a given case, and one must analyze the specific case at hand to determine which is relevant. It is however, possible to identify certain cases for which the motivation for negotiating a buy-back contract cannot be the one identified by Murrell.

Two cases come to mind. First, buy-back contracts are often used for purchases of capital equipment which are to be employed in the raw materials sector, and the materials bought-back are therefore standardized commodities: copper, natural gas, phosphates, and petrochemicals. In these cases there cannot be any need to signal the quality of the 'Eastern' product.

Second, it is not correct to presume (Murrell p. 591) that buy-backs always involve western suppliers of plant and equipment and East European manufacturers. Several buy-back deals have involved the export of capital equipment from a socialist country to a capitalist country and the buy-back of the output by the socialist country (see UNESCO, The Financing of Compensation Projects, 1984, p. 18). In these cases, then, there is no need to signal the



In the case in which the supplier has private information about the level of demand or the price for the product that will be received on the international market a buy-back or compensation can also solve the 'adverse selection' problem. The supplier of the plant and equipment demonstrates its confidence in estimates of future demand, estimates which it may have made in the course of its marketing efforts, through its agreement to buy-back the output at a contracted price: the losses it would maintain in the case of a shortfall in the market price relative to the contracted buy-back price (and conversely the gains it would make in the case of a rise in the price) make the buy-back commitment a powerful signal of its information.<sup>30</sup>

The many deals completed during the 1970's between the Soviet Union and several other socialist countries and major western suppliers of petrochemical manufacturing plant and equipment illustrate this type of compensation

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quality of the 'Eastern' product. A similarly overlooked fact is that contracts analogous to buy-backs are sometimes negotiated between pairs of western firms for the reasons noted in this paper (see P. Mariti and R.H. Smiley, "Cooperative Agreements and the Organization of Industry," Journal of Industrial Economics, 31, 1983, pp. 437-451).

<sup>30</sup> In this case, concern about information regarding future demand, it is not necessary that the commodities counterpurchased derive from the exact plant sold, although it is important that they belong to the same commodity class. There are other examples for which this flexibility in the buy-back exists.

The possibility that related goods not resulting from the original plant may be included in a buy-back agreement and still fulfill the objective is discussed in the GDR handbook: "Die Tilgung des Kredits erfolgt in der Regel durch die Lieferung von Waren, die in den mit Hilfe eines solchen Kredits errichteten Objekten hergestellt werden. ...In verschiedenen Faellen kommt es allerdings zu Abweichungen von dieser Regel, und die Mittel zur Schaffung des Fonds, der zur Tilgung des Kredits bestimmt ist, werden nichts nur aus der Lieferung der im Objekt der Zusammenarbeit hergestellten Produkte gebildet, sonder auch aus der Lieferung analoger Produkte, die in anderen Betrieben der UdSSR hergestellt werden" (Enderlein, Handbuch, 1982, p. 240; emphasis added).

agreement. In one such arrangement the French engineering firm Technip agreed to supply two plants that would each produce 125,000 tons of benzene, 165,000 tons of orthoxylene, and 165,000 tons of paraxylene per year. As compensation for the equipment and licenses the Soviet Union agreed to deliver annually for ten years 20,000 tons of orthoxylene and 20,000 tons of paraxylene plus variable quantities of related petrochemical products. The total value of the deal was \$500 million.<sup>31</sup>

That Technips agreed to repurchase a given quantity of the products was key to informing the Soviets of the residual demand that would likely be available for its supplies, and this has been clearly expressed in the press reports. A spokesman for Technips was quoted as saying that "such amounts are being considered because they are not likely to upset western markets." Technips is in an expert position to make that assessment as they are a major supplier of the plant and equipment utilized by the European chemical industry to produce the products under discussion. In other cases the plant size originally anticipated by the plant buyer has been scaled down precisely because the western supplier of the plant and equipment refused to take the large quantity of buy-backs, thus yielding to the Soviet Union precisely the type of market information, negative in this case, necessary to permit it to calibrate correctly the size and quantity of equipment it should purchase.<sup>32</sup>

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<sup>31</sup> See European Chemical News, July 21, 1978 and The Oil and Gas Journal, October 10, 1977.

<sup>32</sup> See Chemical and Engineering News, August 14, 1978, p. 41: "For example, negotiations between West German engineering firms and the Soviets to build a \$2 billion petrochemical complex at Tomsk in the U.S.S.R. stalled when the Soviets insisted that about half the plant's output be exported to the West, offering about 30 different products as compensation. Krupp-Koppers, the leader of the West German consortium, argued that this would be more end products than the West could absorb, but the Soviets were not interested in paying for the plant with raw materials or hard currency." See also Business Eastern Europe, July 18, 1980, for a case in the wood-working machinery

The second problem generating the need for buy-backs and other sophisticated purchase contracts is referred to as the moral hazard problem, and arises when the seller of the plant and equipment or a third party can affect the value of the commodity to be produced in the plant after the date of sale of the plant. One source of this problem is simply a variant on one of the sources of the adverse selection problem: if the seller of the plant and equipment will have to supply spare parts, or minor technological advances in the plant at a later date, then their willingness to actually fulfill this obligation will determine the actual value of the products produced at the plant.<sup>33</sup> In the case of moral hazard problems, if the sale is made with a simple sale contract and without sophisticated guarantees, then the buyer has no protection against disadvantageous actions at a later date. Moreover, for some types of moral hazard problems these guarantees cannot easily be written into a contract as 'affirmative covenants'. We are concerned not so much with a guarantee that a company supply a specified spare part, but rather with a guarantee that it supply whatever more advanced parts are later developed.<sup>34</sup> Hence, the buyer and seller may use an alternative contracting device in which

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<sup>33</sup> This same factor could also affect the cost of production at the plant, but as we have commented and will repeatedly recall, any influence which the plant seller maintains over the operating costs of the plant are not relevant to a discussion of buy-backs, although they are critical for explaining the use of other contract sale forms, e.g. joint ventures and cross-border equity interests.

<sup>34</sup> The distinction to which we are referring here, mentioned above in footnote 21, is known in the economics literature on efficient contracts as the difference between observable and verifiable information. Observable information cannot be contracted against while verifiable information can be. See the references given in footnote 21.

the guarantees are not written by means of assurances to act on the part of the seller, but instead by giving the seller a stake in the outcome. One device for doing this and especially tailored to our example is the buy-back contract.

A good illustration of a buy-back deal which may have been written for this purpose is the recent agreement between the Volkswagen Corporation and the German Democratic Republic. Signed early in 1984 this agreement obliged VW to deliver a complete production line capable of producing 286,000 engines per year to the GDR. The line to be delivered was, at the time of signing, in operation in the Federal Republic of Germany and will be dismantled and moved to the GDR. The cost of the production line and licensing agreements is to be paid through the delivery to VW of 100,000 motors per year.<sup>35</sup>

By arranging a buy-back of the engines by VW as a joint part of the agreement to purchase the plant and equipment, the GDR creates a tie-in for its output of engines. Most likely the estimated foreign demand for the engines produced in the GDR would have been directly substitutable with new engines produced by VW itself or by VW licensed plants, and the market for the GDR export could therefore have been supplanted by technical advances being made by VW which had not been revealed to the GDR during the negotiations, and which would only be revealed to the GDR to its disadvantage if it had had only a simple sale contract for the plant and equipment. The tie created in VW's commitment to repurchase the engines creates an interest on the part of VW in maintaining a supply of spare parts and machine standards for the equipment in

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<sup>35</sup> See Business Eastern Europe, March 2, 1984 and the Economist, February 18-24, 1984.

the plant, and assures the GDR that any technical developments made by VW will be made to its mutual benefit.

To balance the transaction VW will also deliver 2000 light trucks at the start of the agreed period, and 2300 every year for the remainder of the six year term, and the GDR would counterdeliver various commodities. The value of the plant is estimated at \$107 million and the value of the trucks is estimated at \$122 million.<sup>36</sup>

A final case in which a simple sale contract may not be satisfactory and in which a buy-back contract may be the most appropriate form of sale involves a third party to the transaction. The third party is one who will influence the sale value of the output of the plant -- a variant on the moral hazard problem. For example, the government of the country in which the seller of the plant and equipment is domiciled may choose to impose import restrictions against the output from the plant so that it may not be resold in the plant manufacturer's home country. Alternatively, the third party may simply be the

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<sup>36</sup> The combination of counterpurchase and buy-back in this and other deals illustrates the complex character of each contract, combining features discussed here as distinct, and perhaps adding others. In the case of the VW-GDR deal, the counterpurchase may have been included as a device to guarantee the equal obligations on each side at each point in time so as to guarantee the self-enforcing character of the contract. This type of self-enforcing contracting in the international arena has been discussed very lucidly by Charles Blitzer, Panos Cavoulacos, and Donald Lessard in "Contract Efficiency and Natural Resource Investment in Developing Countries," Columbia Journal of World Business, 19, 1984; with reference to countertrade contracts combining features of counterpurchase and buy-back the objective of self-enforcement has been identified by Kogut, "Selection of Contracts," 1983, p. 24.

In most of the examples of countertrade contracts actually concluded many of the forces discussed in this paper are found in combination with each other and with the forces which have been highlighted by other authors writing on countertrade; nevertheless, it is often possible to identify certain primary or critical issues.

ultimate purchaser of the output, as in the case of the publicly owned utility companies which will be purchasing the natural gas to be delivered in the Urengoi pipeline from the Soviet Union to Western Europe.

In each of these cases there is a moral hazard problem not necessarily involving the seller of the plant and equipment, but involving the third party. Simple sale contracts for the plant and equipment offer no protection to the buyer of the equipment. Countries to which it is targeting its output may impose import restrictions without sacrifice specific to this deal, and sellers of the plant and equipment do not have any incentives to lobby against such actions (ex post) since the exclusion of the commodities from the foreign plant may in fact offer an immediate increase in the domestic market for their plant and equipment. Before the country purchasing the plant commits itself to the purchase, it would like to obtain some assurance that import restrictions will not be applied after the purchase -- or it would like to know of the intention to impose restrictions so that it does not build the plant with the erroneous intention of selling in that market. Similarly, if in the case of output-buyer specific plant and equipment the plant purchaser has agreed to a simple sale contract and it has not pre-contracted for product purchases at an established price index, then it can anticipate subsequently to negotiate a very disadvantageous sale price for its output. Before the country purchasing the gas pipeline equipment completes all of the agreements and the pipeline as well, it needs to complete supply agreements with its customers. If it does not, then these customers will be in a superior bargaining position when the pipeline owner attempts to sell its output.<sup>37</sup>

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A similar situation is referred to in more general discussion as the 'ex post bargaining problem': if the plant and equipment are designed and located to supply a particular buyer of the output, then the buyer may be willing to pay a different price after the plant has been purchased and constructed than

Two factors may cause the problem with the third party to be resolved through a buy-back agreement involving the seller of the plant and equipment and the purchaser of the plant instead of exclusively between the purchaser of the plant and the third party, the country or the purchaser of the ultimate plant output: i) the identity of the plant seller and the third party may in certain cases converge, or their interests may converge, and ii) it may not be possible to untie the sale of the plant from the contracts for the sale of the output, so that the entire package must be negotiated as one entire piece. If the seller of the plant and equipment is a government or if the seller is influential with a government, and if the seller's interests are of concern to the government, then we may speak of a moral hazard problem involving the original seller of the plant and equipment, and the buy-back contract serves the purposes discussed above in the case of the traditional moral hazard problem. If a buy-back contract has been negotiated, then countries imposing import restrictions will be sacrificing the sale earnings of their domestic corporations instead of the foreign competition.<sup>38</sup> In the case of the ex post

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it would have been willing to pay beforehand. In fact, the output is of the same value to the buyer before and after, but the buyer of the plant output is in a stronger bargaining position once the plant operator has purchased the plant and put it in place than it was in before the purchase of the plant and this is reflected in the price which it is willing to negotiate for the output. For discussion of this problem in general see Oliver Williamson, "Transaction Cost Economics: The Governance of Contractual Relations," Journal of Law and Economics, 22 (1979), pp. 233-262; with regards to the electrical generation industry see Paul Joskow and Richard Schmalensee, Markets for Power, Chapter 10, MIT Press, Cambridge, 1983.

<sup>38</sup> The effectiveness of this application of buy-back contracts is illustrated in a story regarding an attempt to impose export controls made by the Austrian government against a Hungarian firm and the favorable resolution from the perspective of the Hungarian firm; see Business Eastern Europe, February 25, 1983.

For the purpose of creating a disincentive for import restrictions it should be equally satisfactory to include in the buy-back contract technologically unrelated goods, i.e. counterpurchase, and in fact the case described in BEE was one primarily involving counterpurchase. Buy-backs, are,

bargaining, the buy-back contract establishes the output sale price before the plant and equipment have been purchased and put in place, and therefore maintains the bargaining power of the operator and so yield to the operator a higher sale price for the plant output.

These cases, however, add an additional twist to our discussion of buy-back deals. In these two cases, concern for the exclusion from certain markets and the concern for the ex post bargaining strength of the output purchaser, the buy-back contract can be written with prices tied to a 'world market price'. This makes no sense for the buy-back contracts intended to yield information about product quality and ultimate sale price, since the key to the plant purchaser is to be protected against movements in the world market price. In each of the two cases at hand, however, the concern is to sell some quantity at the price prevailing and observable in an identifiable market. The plant purchaser is concerned that the output purchaser will seek a discount from the 'world market price' through a threat to refuse to take any output; hence it is satisfactory to guarantee that it will take a given output without also receiving assurances that the price will attain any given level other than the then prevailing one.

This analysis may apply to the compensation agreements negotiated between Poland and several banks and suppliers of the equipment utilized to develop the Polish coal and copper deposits. Several loans were extended to Poland for this purpose during the years 1975-1979, and the loans were to be repaid

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however, equally useful for this end, and for various reasons relating to the legal relationship of the credit financing the plant and equipment may be the most viable device with which to combat protectionist action.



using the funds generated by the sale of the copper and coal products in western markets. The copper and coal contracts did not specify prices and in the case of copper often did not specify particular buyers.<sup>39</sup>

In the construction of the Urengoi pipeline the Soviet Union committed itself to the supply of natural gas to the western European market. There will be a market price for natural gas and competing fuels in other markets at the future date. The price in these spot markets can be and are being used as the 'floating' contract rate for the buy-back of natural gas to be made by the western European states, but it is critical that they commit to purchasing a quantity through the pipeline. This type of contracting is quite typical in natural gas markets, including intrastate and interstate pipeline markets in the United States.<sup>40</sup>

Our discussion of buy-back contracts points out how these agreements represent efficient agency contracts which increase the quality and extent of trade in productive resources. Of course, we have mentioned reasons which apply equally as well to commercial relations between firms of a single country as they do to relations between firms domiciled in separate countries or commercial relations between countries or one company and country. The only exception is the case in which trade restrictions imposed by a country are of critical concern. Typical discussions of buy-back arrangements focus upon justifications presumed to lie in the 'special' realm of international

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<sup>39</sup> See UNESCO, The Financing of Compensation Projects, 1984, pp. 22-25 for details of these deals.

<sup>40</sup> See for example, Structure and Trends in Natural Gas Wellhead Contracts, Energy Information Administration, DOE/EIA-0419, Washington DC, November 1983.

trade in general or East-West trade in particular. In contrast, we have argued that buy-backs are simply an efficient contracting form between agents who, in the case at hand, happen to maintain a cross border relation. Hence, we believe that buy-back arrangements are comparable to project financing arrangements conventionally understood in corporate finance -- although some of the risks under discussion may be peculiar to the international and even to the East-West context.<sup>41</sup>

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<sup>41</sup> This similarity has been noticed by socialist analyses of compensation arrangements: "Wenn auch die Geschaefte auf Kompensationsbasis eine grosse Bedeutung fuer die Erweiterung der wirtschaftlichen Zusammenarbeit zwischen Staaten mit unterschiedlicher Gesellschaftsordnung haben, so ist ihr Anwendungsgebiet jedoch nicht auf die intersystemare Zusammenarbeit beschraenkt. Diese Form wird vielmehr auch im Handel zwischen Firmen kapitalistischer Laender praktiziert" (Enderlein, Handbuch, 1982, p. 252).

For a good overview of various 'countertrade' style contracts between private firms in western countries see Mariti and Smiley, "Cooperative Agreements," 1983.

## V. Conclusion

The recent rise in the use of countertrade has prompted a powerful reaction among various institutions. In the western press the phenomenon has largely been introduced under the headline "BARTER IS BACK" or some similarly evocative expression. This agitated discussion has as much confused the issues as it has clearly presented them: it has created, for example, the association in many minds of barter with the complex forms of countertrade. Among many western businesspersons the phenomenon has been greeted with consternation and complaint regarding the curious requirements necessary for an export deal to be successfully closed. The response on the part of the US government and other members nations of the OECD has been hostile from the outset.<sup>42</sup> Many western economists have formalized these objections in various

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<sup>42</sup> In his statement to the ministerial meeting of the OECD in Paris, May 9, 1983, US Secretary of State George Shultz commented in regard to East-West trade that, "A third problem in East-West economic relations is the attempt by the state trading countries of the East to use their mono-personistic power to shift the balance of advantage in their favor, such as playing Western suppliers off against one another to obtain preferential credits, buy-back arrangements, or other special advantages. These anti-competitive practices have a great potential to do harm to all our countries" (Department of State Bulletin, July 1983, p. 47).

Mr. Jacques de Miramon of the OECD Trade Directorate had earlier expressed more pointedly comparable concerns related not only to East-West trade, but to countertrade practices in general; see de Miramon, "Countertrade: Modernized Barter System," The OECD Observer, January 10, 1982, pp. 12-15.

Other commentary on the part of US trade officials has been reported in Business Week: "The Treasury is 'flatly opposed to countertrade because it remains focused on conventional financial transfers,' says an Administration official. 'The U.S. Trade Representative fears that countertrade will undermine our multilateral trade policy,' he adds. ...Lionel H. Olmer, Under Secretary of Commerce for international trade, calls countertrade 'bad business' that 'contravenes our commitment to an open international trade and monetary system.'" (July 19, 1984, pp. 118-9, emphasis added). More recently the US position has been clarified to include exclusively a condemnation of countertrade practices pursued by governmental organizations as opposed to those contracted to 'freely' in negotiations between private firms (see H.P. Goldfield, Assistant Secretary for Trade Development, Forward to Verzariu, International Countertrade, 1984, pp. i-ii), although it is not clear that

articles. Nevertheless, the trend toward the expanded use of countertrade has continued.

We recognize that the concerns regarding this relatively new type of international trade stem from various cases in which it has been used as a device for protectionist purposes or to disguise many disadvantageous administrative policies, and we recognize as well the need to maintain an internationally acceptable system of trade rules and standards of behavior. At the same time, we have identified in this paper several valuable commercial purposes to which countertrade policies are likely to be targetted and which are to the advantage of a developed and extended multilateral trading system. This would suggest that despite efforts to proscribe them, countertrade practices will continue to impose upon the world trade system, that efforts to block their general application will meet with strong opposition, and that if these efforts succeeded it would be to the disadvantage of all. This analysis therefore suggests the need to incorporate countertrade devices into the system of acceptable trading practices, and, importantly, it suggests the need and potential to develop our ability to discern the abusive use of such practices from their legitimate uses much as we discriminate among the uses to which various other practices are put.

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this precisely stated position is evidence of a greater recognition of the essentially commercial purposes for which many country imposed countertrade policies are intended.

These attitudes have been reflected in the sluggishness with which these nations have moved to develop even tolerant legal and administrative trade practices. On the contrary, several OECD member countries recently pressed the GATT to attempt some regulation on the subject of 'barter' trade, although any efforts to discourage countertrade transactions was blocked by other member nations of the GATT (see "GATT Weighs the Evidence of Discrimination in the Growing Practice of Global Bartering," The American Banker, September 21, 1984, pp. 39-41).

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